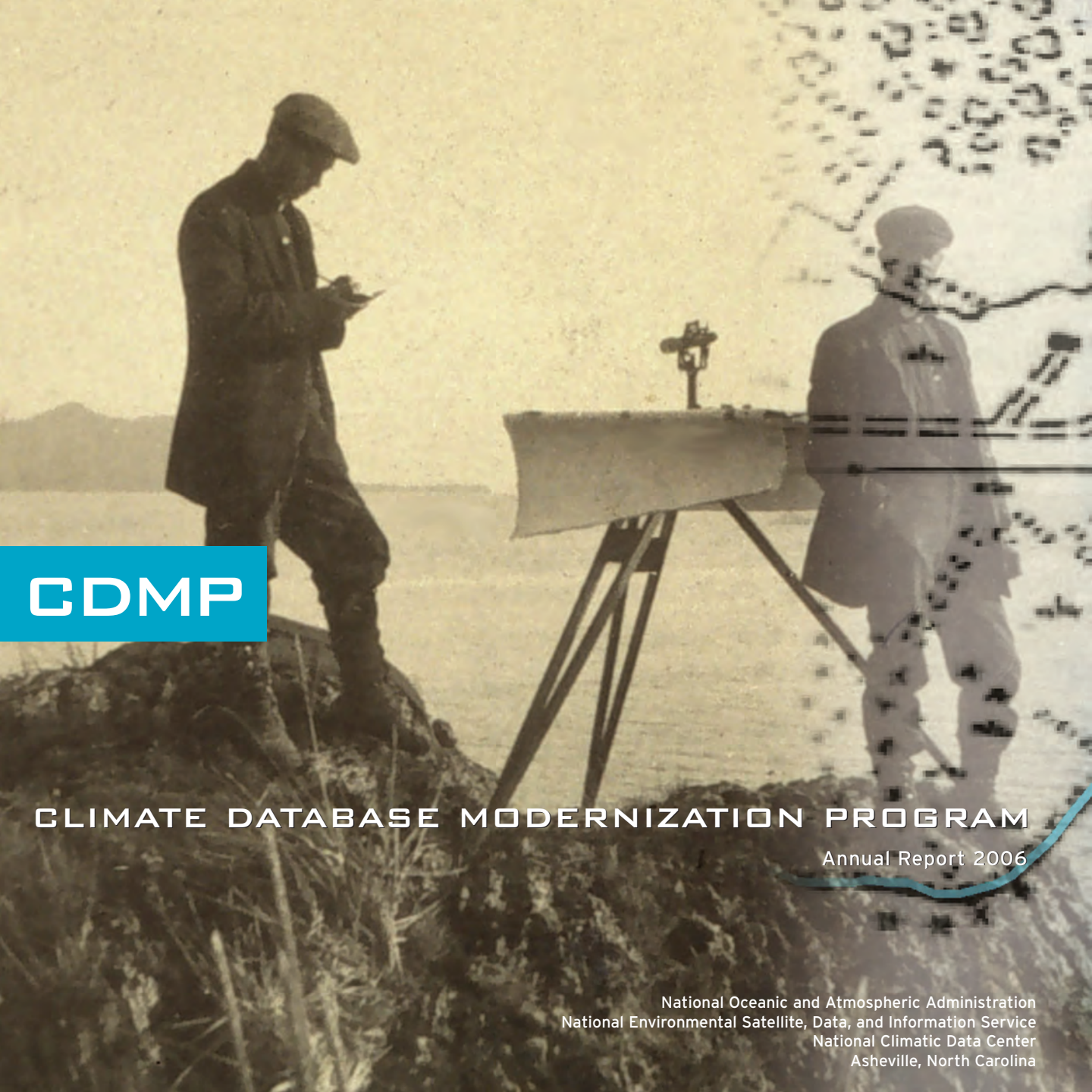


CDMP

CLIMATE DATABASE MODERNIZATION PROGRAM

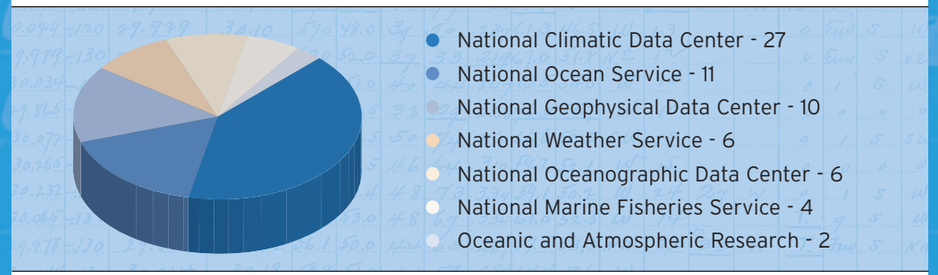
Annual Report 2006

National Oceanic and Atmospheric Administration
National Environmental Satellite, Data, and Information Service
National Climatic Data Center
Asheville, North Carolina

IT'S BEEN ESTIMATED THAT WEATHER AND CLIMATE AFFECT ONE THIRD OF THE GROSS NATIONAL PRODUCT INCLUDING EVERY SEGMENT OF THE ECONOMY SUCH AS ENERGY, TRANSPORTATION AND WATER RESOURCES. THE ENVIRONMENTAL DATA THAT CDMP IS PUTTING TOGETHER HAS AN IMPORTANT IMPACT.

TOM KARL
DIRECTOR
NATIONAL CLIMATIC DATA CENTER

FY06 TASK BY NOAA ORGANIZATION

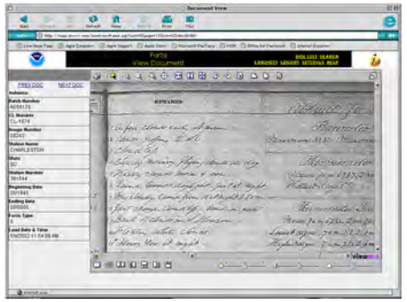


Total number of NOAA CDMP projects reached an all-time high (60+) in 2006

ON THE COVER: Doug Graham of NOAA's National Geodetic Survey created this collage that includes an historic survey image, shoreline vector image as well as an html page view from NOAA Shoreline Data Explorer.

CDMP – Supporting NOAA's Stewardship Commitment

The Climate Database Modernization Program (CDMP) supports NOAA's mission to collect, integrate, assimilate and effectively manage Earth observations on a global scale, ranging from atmospheric, weather and climate observations to oceanic, coastal, and marine life observations. Many of these holdings, which are part of the U. S. National Archives, were originally recorded on paper, film, and other fragile media, and stored at various NOAA Centers. Prior to CDMP, not only were these valuable data sources mostly unavailable to the scientific community, storage technology for the archives was not state-of-the-art. Without proper preservation of the media, the information they contained was in danger of being lost forever.



Today, CDMP has greatly improved the preservation and access to NOAA's holdings by migrating many of these resources to new digital media. Digital images of many of the holdings are now available online, and millions of historic data records have been keyed and integrated into digital databases, with more added continually. CDMP projects span the full spectrum of NOAA, supporting all five line offices.

CDMP also works with U.S. Regional Climate Centers, State Climatologists, the U.S. Air Force, the World Meteorological Organization, and foreign meteorological services in Europe, Africa, Asia, and the Americas. These efforts not only benefit NOAA, but researchers and data users throughout the Nation and world-wide. The increase in data accessibility and inclusion of these historical data sets into the integrated global databases needed by today's climate and environmental data users validate the CDMP mission: to make major climate and environmental databases available via the World Wide Web.

Major CDMP Tasks 2006

National Environmental Satellite, Data, and Information Service

Hourly Surface Observations: imaging & keying
Hourly Precipitation Data: imaging & keying
Daily Cooperative Observations: imaging & keying
Mexican Daily Data: imaging & keying
Upper-Air Observations: imaging & keying
Defense Meteorological Satellite Program film: imaging
Heat Capacity mapping data
Glacier Photos: imaging
Marine Geophysical Records: imaging & keying
Tsunami Event Gauge Records: imaging & keying
Historical Solar and Spectral Observations: imaging
Finnish & Swedish Lightship data: imaging & keying
Ionospheric observations: keying
Marine observations: keying
NOAA Library Rare Climate Publications: imaging
Monthly Weather Review: searchable indexing
Historical International Polar Year: imaging
Station history & metadata development
Subscription services

National Marine Fisheries Service

Lightship observations: imaging and keying
Data recovery on cetaceans: imaging and keying
Fish egg & larvae: keying
Reef Environmental Education Foundation: imaging
Historical plankton: keying
Historical aerial photography: image conversion
Magnetic Tape recovery

National Ocean Service

Shoreline Charts: vectorizing & georeferencing
Nautical Charts: imaging
Thunder Bay historical collections: imaging & keying
CA Marine Ecosystem Survey: imaging & keying
Geo-location of historical maps and nautical charts

National Weather Service

African Upper-Air Observations: keying
Uruguay & Chile surface data: imaging & keying
Atlantic Basin Tropical cyclone "storms wallets": imaging

Office of Oceanic and Atmospheric Research

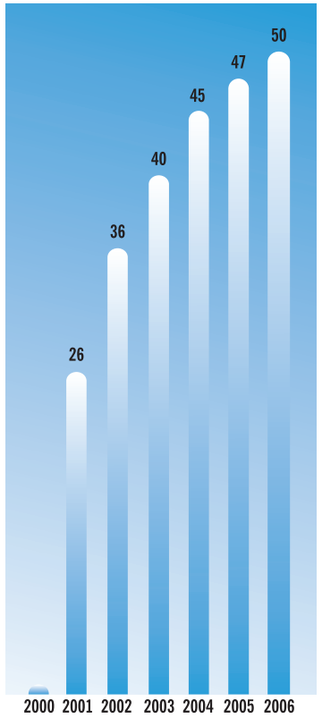
WMO Pub 47: imaging
Hurricane reconnaissance: imaging and streaming video
European historical ship logbooks: imaging & keying

U.S. Regional Climate Centers

Database conversion and quality control

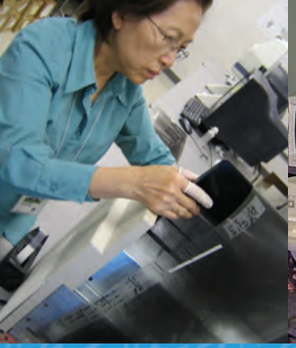
CDMP Major Program Achievements

The National Oceanic and Atmospheric Administration's Climate Database Modernization Program has just completed its seventh year. The demand for rapid and complete access to the Nation's and world's climate data by researchers and global change scientists was a key driver in the establishment of CDMP, which is managed through NOAA's National Climatic Data Center (NCDC) located in Asheville, NC. This program was initiated by Congress to assist NOAA in modernizing and improving access to the Nation's climate data and information.



Amount of records available online (in millions)

Partnering with four private sector contractors, CDMP has placed online around 50 million weather and environmental images. These historic documents are now available to researchers around the world via the Internet. The amount of data online has grown from 1.75 terabytes in 2001 to over 7.0 terabytes in 2006. Major advances continue in making these data available on the web through a number of NOAA web sites (see URL list on inside back cover). In addition, during the past year over four million hourly weather records keyed through CDMP were integrated into NCDC's digital database holdings, extending the period of record for many stations into the 1890's. CDMP-keyed daily data records will soon extend this data period back as much as another 100 years.



CDMP PROJECTS HAVE CREATED SCORES OF NEW PRIVATE SECTOR DATA ENTRY/INFORMATION MANAGEMENT JOBS IN SEVERAL ECONOMICALLY CHALLENGED AREAS IN WEST VIRGINIA, KENTUCKY AND MARYLAND.



NOAA's Partners in the CDMP Project

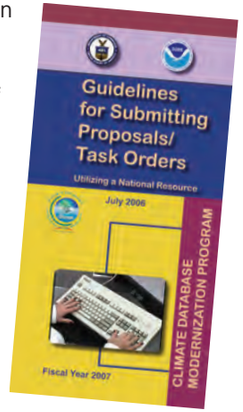
The CDMP could not exist without the extraordinary efforts of people within NOAA and those in the private sector who do the keying, imaging, and database development.

CDMP projects have created scores of new private sector data entry/information management jobs in several economically challenged areas in West Virginia, Kentucky and Maryland. The project tasks supported by CDMP are well suited for the private sector. Many of these tasks have been shifted from government employees to CDMP contractors in the above mentioned states. Tasks performed by these contractors include the printing and distributing of the NCDC serial climate publications, managing accounts receivable, imaging and keying of incoming records, hosting and maintaining the images online, and providing expert personnel in support of various projects.

The three prime contractors for CDMP include Information Manufacturing Corporation, Rocket Center, West Virginia; SourceCorp, Mount Vernon, Kentucky; and Lason Systems, Inc., Beltsville, Maryland. Excellent support is also provided by the NCDC on-site contractor, STG Corporation, whose staff prepares many of the data for shipment and performs extensive quality control on the returning data products. With over 60 projects ongoing, the contractors must remain focused and flexible to meet each project's requirements.

CDMP - Expanding Opportunities in NOAA

CDMP sponsors an annual Data Access Workshop as a forum for information and an experience exchange between the various NOAA task leaders and CDMP contractors. The workshop, held at various NOAA facilities, allows for the presentation of new and continuing proposals by NOAA agencies for the upcoming year's program. This workshop process allows CDMP staff to evaluate data rescue projects within the NOAA organization.



Currently, around 40 NOAA (non-NCDC) projects are supported through CDMP. The workshop forum is expected to continue in the future as data modernization efforts expand, providing other NOAA agencies a convenient means of accessing the resources of CDMP.

Above are some of the participants in the NOAA CDMP Data Access Workshop held on November 15-16, 2006, at NOAA's Coastal Service Center in Charleston, SC.

CDMP - Preserving Environmental Images of Our World

An important part of CDMP's mission is preserving rare and valuable scientific images.

The photographs on this page have all been converted to digital image files through CDMP.

Sixty-year change in Alaska's Muir Glacier, as photographed by William O. Field on 13 August 1941 (left) and by Bruce F. Molnia on 31 August 2004 (right). From the National Snow and Ice Data Center's Online Glacier Photograph Database (http://nsidc.org/data/g00472.html).

Incredible devastation caused by the 1906 San Francisco earthquake and fire is shown in this image of an original San Francisco Examiner newspaper printing. Also imaged and preserved is a related editorial written by legendary Examiner publisher William Randolph Hearst.

This and many other spectacular images of killer whales can be found online at the Northwest Fisheries Science Center's Marine Mammal Image Library (http://www.nwfsc.noaa.gov/resources/killer_whale/index.cfm).

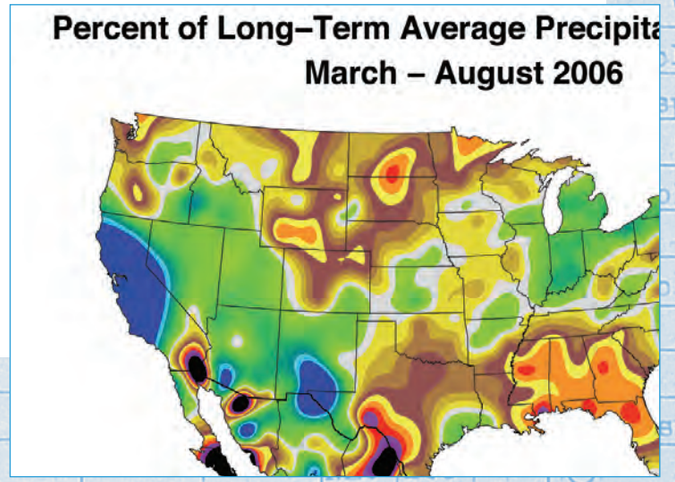
CDMP - NOAA's International Projects

NOAA data rescue efforts under the CDMP program have an international component which fosters cooperation in the exchange of data. In order to have the most complete global database available for researchers and other users, NOAA, under the CDMP program, is rescuing and digitizing data in many areas of the world where there are gaps and holes in available global climate and environmental databases. In the past, this has included successful joint projects all over the globe, including Uruguay, Finland, Sweden, Germany, Malawi, Senegal, and Mozambique, just to name a few of the nations which have worked with CDMP.

In 2006, CDMP's international reach stayed close to home, coordinating with México's National Meteorological Service (SMN - Servicio Meteorológico Nacional) in a joint venture to preserve valuable daily surface weather observations dating from 1982 to as far back as 1878. These observations are from 92 national observatory stations and about 35 cooperative observing stations located throughout México. The observations are contained in paper logbooks, stored in non-climate-controlled conditions in the SMN headquarters offices in México City. These records were in danger of loss or significant deterioration from environmental hazards such as moisture, mold and insects.

With the help of CDMP, imaging stations were set up at SMN headquarters. To date, all of the logbook pages (more than 431,000) have been imaged onto digital media kept in both México City and in at least three places in the US, preserving these logbook entries before their valuable data were lost. Next comes the keying of the data – a challenge made more difficult in that the data were recorded into at least 20 different logbook formats. However, CDMP specialists were able to put together instructions for the data keyers to handle all the formats, and the data are now being keyed from those images into a digital database.

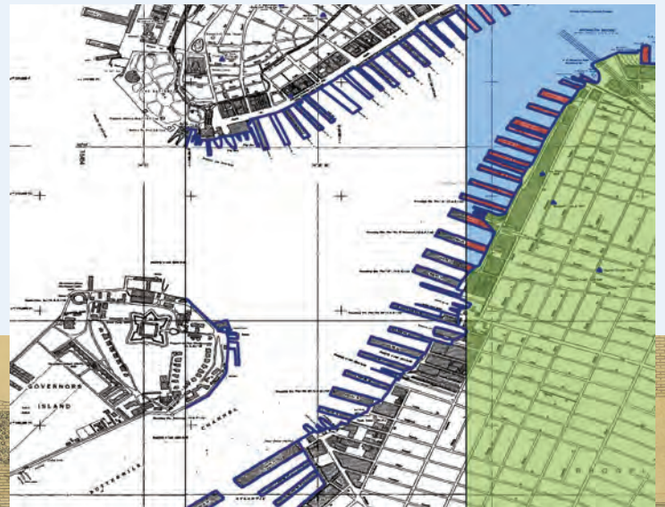
This data keying should be completed in late 2008. In anticipation, scientists are already envisioning ways the data will be used. Among these will likely be the enhancement of indices used by the North America Climate Extremes Monitoring system. This important system includes the North America Drought Monitor, a cooperative effort between drought experts in Canada, México and the United States, which is an integral tool for drought planning, preparedness and mitigation efforts throughout the North American continent. The integration of these new Méxican data should help improve the Drought Monitor and other aspects of this system, yet another way NOAA's international projects contribute to a better understanding of our global climate.



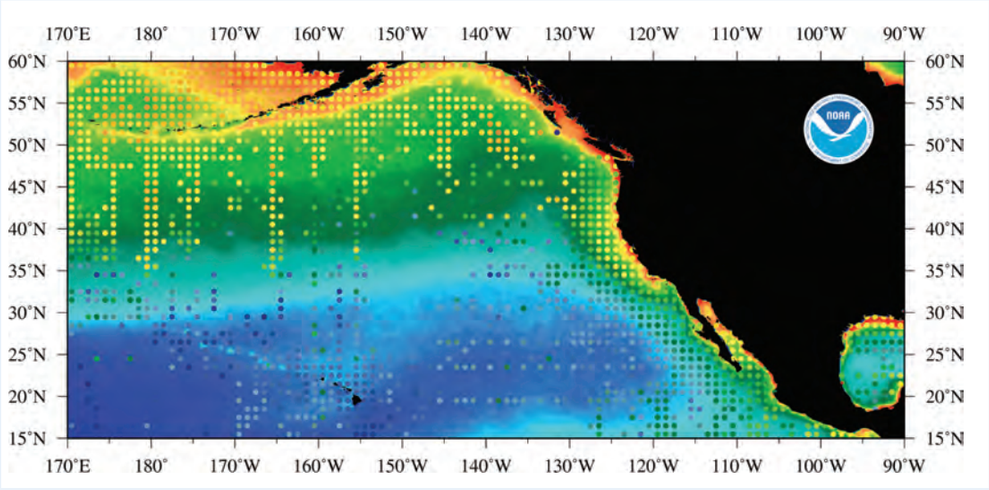
CDMP - More Than Just Climate Data

The name "Climate Database Modernization Program" may lead one to believe that CDMP is only about historical climate and weather records. In fact, a majority of NOAA projects supported by CDMP are in scientific fields other than weather or climate. Among those are several projects related to the Earth's waters, from the shoreline to the greatest ocean depths.

The Shoreline Vectorization and Access to Coastal Data project is an ongoing collaborative effort between the NOAA Coastal Services Center, the National Geodetic Survey, and CDMP partner contractor Information Manufacturing Corporation to produce geographic information systems (GIS)-compatible shoreline data that are readily accessible to shoreline managers and the public. In this project, historic topographic manuscripts of our Nation's shoreline, called "T-sheets," are converted into vector and georeferenced raster data, creating a seamless nationwide shoreline dataset. This dataset is distributed through the NOAA Shoreline Data Explorer web site (see URL at end of report). Through CDMP, over half of the nearly 15,000 available historic T-sheets have been converted into these valuable GIS-compatible shoreline data.



The three stages of shoreline vectorization are shown above. At left is an unedited georeferenced image; In the center panel, shoreline vectorization has been performed (blue lines); and at right, vectored polygons of land, water, and manmade areas have been added.



Dots represent zooplankton biomass values as keyed through CDMP; background color shows satellite-based phytoplankton biomass. Here, a basic relationship between zooplankton population and the abundance of their food is evident ("redder" values indicate higher concentrations).

Another successful CDMP foray into the world's oceans is the CDMP Plankton Data Rescue project, managed in cooperation with the National Marine Fisheries Service. In this project, in-situ samples of marine zooplankton population – a crucial component of oceanic ecosystems and commercial fisheries – which previously only existed in paper and data table format, have been keyed. This comprehensive collection of zooplankton data is available online via the Coastal & Oceanic Plankton Ecology, Production, & Observation Database (www.st.nmfs.gov/plankton).

CDMP - NOAA and Private Sector Projects

NOAA's Thunder Bay National Marine Sanctuary is dedicated to fostering historic shipwreck preservation, and creating an awareness of Great Lakes maritime heritage. To this end, the sanctuary, in partnership with the Alpena County Library and CDMP, has embarked on an ambitious plan to collect and digitize Great Lakes maritime archival material. This Thunder Bay Research Collection consists of 1,000 published works; 65,000 photographs; 56 linear feet of vertical files; 40 feet of periodicals; 60,000 vessel index cards; 350 shipbuilding plans; numerous manuscripts and ephemera; and an index of over 15,000 vessels, complete with descriptive data and highlights of the ships' careers and their ultimate losses. These archival materials, which provide invaluable insight into the development of Great Lakes watercraft, might be lost forever without the funding for imaging provided by CDMP. Additionally, researchers will now have easier access to the digital images of these original documents and photos. The Thunder Bay Research Collection imaging is a perfect example of a project which enables CDMP to fulfill it's mission of preserving and making accessible valuable and historic documents like these.

Ice coats this classic Great Lakes schooner. This photo, taken in the 1800's and part of NOAA's extensive Thunder Bay Research Collection, has been imaged and preserved by CDMP.

Web Addresses for NOAA Organizations:

National Oceanic and Atmospheric Administration (NOAA)
www.noaa.gov

NOAA's National Environmental Satellite, Data, and Information Service (NESDIS)
www.nesdis.noaa.gov

NOAA's National Climatic Data Center (NCDC)
www.ncdc.noaa.gov

NOAA's National Geophysical Data Center (NGDC)
www.ngdc.noaa.gov

NOAA's National Oceanographic Data Center (NODC)
www.nodc.noaa.gov

NOAA's National Ocean Service (NOS)
www.nos.noaa.gov

NOAA's National Marine Fisheries Service
www.nmfs.noaa.gov

NOAA's National Weather Service
www.nws.noaa.gov

NOAA's Office of Oceanic and Atmospheric Research
www.oar.noaa.gov

Selected Project Specific URL's

NOAA Shoreline Data Explorer
www.ngs.noaa.gov/newsys_ims/shoreline/index.cfm

NOAA Coastal Explorer
coastalexplorer.imcwv.com

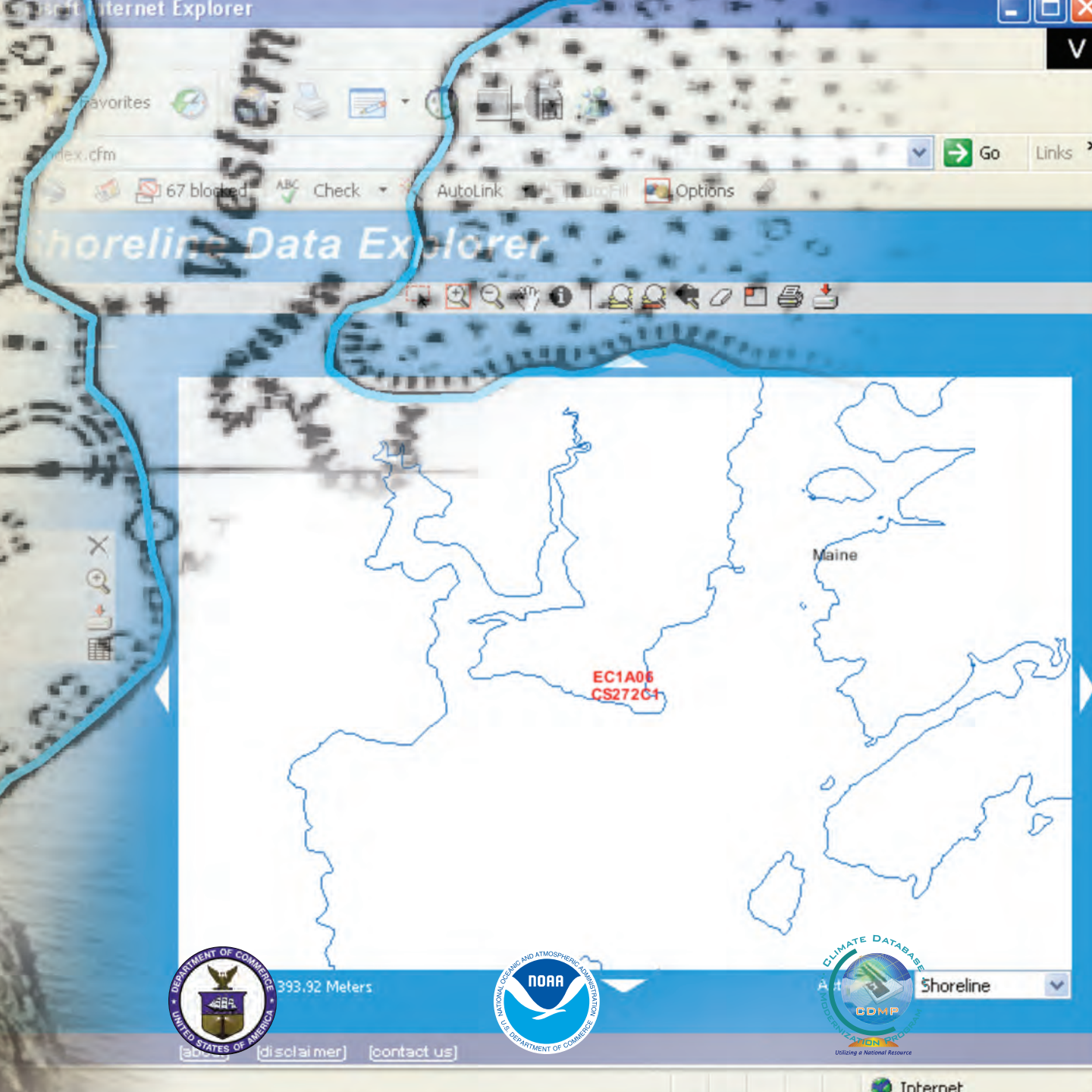
Defense Meteorological Satellite Program (DMSP)
www.dmsp.ngdc.noaa.gov/dmsp/index.html

NOAA CENTRAL LIBRARY IMAGING PROJECTS
Daily Weather Maps (1871-2002)
docs.lib.noaa.gov/rescue/dwm/data_rescue_daily_weather_maps.html

U.S. Signal Office Annual Reports (1861-1891)
docs.lib.noaa.gov/rescue/cso/data_rescue_signal_corps_annual_reports.html

MONTHLY WEATHER REVIEW
Coast and Geodetic Survey Annual Reports (1852 -1950)
docs.lib.noaa.gov/rescue/cgs/data_rescue_cgs_annual_reports.html

U.S. Fish Commission Annual Reports (1871-1940)
docs.lib.noaa.gov/rescue/cof/data_rescue_fish_commission_annual_reports.html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